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Can Augmented Reality be utilised for disease education in health sciences and medicine?

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Augmented reality (AR) offers users the ability to interact with virtual 3D models of the human body, providing a great potential for improving one's understanding of health. The aim of this study was to assess the effectiveness of AR in contrast with a pamphlet as a learning tool. 59 participants were randomised into two groups, one used AR and the latter used a printed pamphlet to learn identical content relating to stroke. Participants answered a pre-test multiple choice questionnaire to evaluate knowledge prior to the intervention. A Likert-scale questionnaire was used to determine participant perceptions post-learning intervention, followed by another multiple-choice post-test. Pre- and post-test scores suggested that participants learned in both interventions, although there were no significance differences between the interventions themselves. Participants reported better learning experiences when using AR, perceived that AR allowed them to better understand anatomy and that AR was a better learning tool.

Keywords: Augmented Reality, Mixed Reality, Health, Medical Education, Tertiary Education

Introduction

Stroke poses a concern in modern healthcare, with it constituting 6.8% of the total burden of disease yet remaining preventable in many cases. As stroke affects many Australians, it may be beneficial to provide accessible and understandable information relating to stroke. Technologies such as augmented reality (AR) can allow people to interact with virtual renders of anatomy, showing great promise in improving ones understanding of health (Moro et al., 2017). In addition, the introduction of novel and technology-enhanced learning tools can assist students studying health to better understand the concepts (Moro & McLean, 2017). The aim of this study was to assess the effectiveness of AR in contrast with a pamphlet as an educational tool by assessing learning acquired from each, as well as participant perceptions of the two different delivery modes.

Methods

59 participants were randomised into two groups, one using AR (n=32) and the latter using a printed pamphlet (n=27) to learn identical content relating to stroke. Participants answered a pre-test multiple choice questionnaire to evaluate knowledge prior to the intervention. A Likert-scale questionnaire was used to determine participant perceptions post-learning intervention, followed by another multiple-choice post-test. A Mann-Whitney U test analysed the significance between pre- and post-test scores. A D'Agostino and Pearson Normality Test found that the Likert-scale data was normally distributed, allowing for a Student's two-tailed unpaired t-Test to assess variations in the AR and pamphlet interventions.

Results

Pre- and post-test scores suggested that participants learned from both interventions ($p<0.001$), with no significance differences between the interventions themselves. However, participants reported better learning experiences when using AR ($p<0.001$), perceived that AR allowed them to better understand anatomy ($p<0.005$) and stated that AR was a better learning tool ($p<0.001$). Participants also felt AR would help their non-student friends or family to better understand stroke compared the pamphlet intervention ($p<0.001$).

Conclusion

Participants preferred AR over pamphlets as a learning tool, with both modes being equally effective for participant learning and stroke education.

References

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